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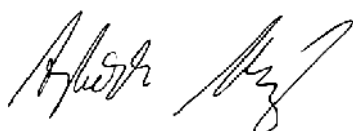
Martin Libra: Community structure of caterpillar parasitoids from tropical rainforest

The PhD Thesis of Martin Libra focuses on diverse but taxonomically largely unknown communities of parasitoids feeding on caterpillars in tropical rainforests of Papua New Guinea and uses them to examine a general ecological problem: what are the key drivers of species turnover among communities. This theme is particularly interesting for parasitoids for at least three reasons: (i) beta diversity of the third trophic level is particularly unpredictable as it may be impacted by beta diversity of host herbivores, and host plants of these herbivores; (ii) ichneumonid parasitoids may represent one of the few taxa exhibiting anomalous trends of decreasing diversity from tropical to temperate latitudes, for the reasons that remain unclear, and (iii) the changes in community composition may generate trends in parasitism risk for host herbivores, much less examined than the analogous trends in predation risk.

The thesis combines experimental approach in the field with the analysis of large sets of high-quality community data, obtained by rearing parasitoids from their hosts. The first chapter describes beta diversity of eight plant-caterpillar-parasitoid systems within a 150x500km continuous lowland tropical rainforest, the study system available only in three geographic regions on the planet. This is probably the most interesting chapter, showing how the trophic web can progress from relatively homogeneous vegetation to the third trophic level characterized by high beta diversity, most likely due to dispersal limitation. The second chapter explored elevation gradients in several New Guinea data sets and demonstrated that the anomalous latitudinal gradient in ichneumonid diversity is replicated also along elevation gradient in tropical mountains, where ichneumonid diversity decreased with increasing elevation. The third chapter, published in the *Entomologia Experimentalis et Applicata*, pioneers parasitism experiments using reared host caterpillars to show decreasing parasitism risk with elevation. The last chapter, contributed to by M. Libra, is a taxonomic work describing three new tachinid species reared from temperate zone caterpillars. Overall, some of these results can become foundational, the first rigorous data sets addressing a particular ecological problem, such as rainforest beta diversity in tri-trophic food webs, and the diversity patterns of ichneumonids in tropical mountains.

M. Libra have shown convincingly his ability to design and execute ecological experiments in biologically and logistically complex tropical forests of Papua New Guinea. Further, he has been able to identify and/or develop species concepts for difficult parasitoid fauna of New Guinea using morphological and molecular methods. He was also able to contribute to the taxonomy of the parasitoids. The ecological analysis used modern biostatistical methods focused on well-defined set of ecological hypotheses, some of them novel. This was the case both for the study of beta diversity drivers in lowland rainforests, and when trying to explain the anomalous ichneumonid trends in diversity with elevation. The tropical field work required considerable skills in the organization of the field logistics and training and leading teams of local assistants. The analysis of reared parasitoids would not be possible without extensive networking with taxonomists.

In summary, it is my opinion that Martin Libra has clearly demonstrated his ability to lead independent, innovative research. Further, he also possesses the necessary practical and social skills required to build an independent research team. I therefore unreservedly recommend his Thesis for defense.



Vojtěch Novotný
PhD supervisor